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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,363	09/04/2003	John G. Edelen	2001-0886.01	1567
21972	7590	06/28/2005	EXAMINER	
LEXMARK INTERNATIONAL, INC. INTELLECTUAL PROPERTY LAW DEPARTMENT 740 WEST NEW CIRCLE ROAD BLDG. 082-1 LEXINGTON, KY 40550-0999			NGUYEN, LAMSON D	
		ART UNIT		PAPER NUMBER
		2861		
DATE MAILED: 06/28/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/655,363	EDELEN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Lamson D. Nguyen	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on Amendment dated 03/30/05.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-31 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                     | Paper No(s)/Mail Date. _____ .  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____ .                                  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 10, 14, 16, 25, and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrigan (6,546,177) in view of Conta (6,371,589) and Ishinaga et al. (US 2002/0149657).

Carrigan teaches an inkjet head (figure 1b) and a method of controlling the temperature of the printhead (figure 28), resistor elements to the heat the printhead (column 35, lines 20-31; figure 31, element 3115), a controller of the resistor element (figure 1b, element 124), and temperature sensors operatively connected to the controller to enable the controller to monitor the chip temperature the resistors to heat the chip.

Carrigan fails to teach a silicon substrate, MOS logic blocks, and the sense resistors implanted in the silicon substrate.

Meanwhile, Conta et al disclose a printhead chip consisting of MOS logic blocks (column 1, lines 53-60), a silicon substrate (figure 2, silicon substrate 10) and Ishinaga teaches a diode embedded in a silicon substrate (figure 22, substrate 620, diodes 622 and 623).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Carrigan to incorporate the teaching of silicon substrate, MOS logic blocks, and embedded diode taught by Conta and Ishinaga, respectively, for the purpose of integrating several components of a printhead using fewer manufacturing steps and thereby reducing power consumed, supporting a printhead and detecting printhead's temperature, respectively.

Claims 2-9, 11-13, 15, 17-24, and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrigan in view of Conta and Ishinaga as applied to claims 1 and 16 above, and further in view of Tanaka et al (US 2002/0060333), Aswell (US 2001/0050410), and Stanley Wolf, Silicon Processing for the VLSI era, volume 2, lattice press, 1990, pages 354-356.

Carrigan in view of Conta and Ishinaga disclose all claimed features of the invention except a TCR of at least .004 ohms/degree C.

Aswell discloses that the TRC may range from 600-6000 ohms/degrees C (.0006 to .006 ohms/degrees C), paragraph 0038 and that the thickness of the resistor is 1um, paragraph 0007. The length and width of the resistors depend on the sheet resistance and would be obtained with the formula of paragraph 0005; if one dimension is chosen, the other is thereby obtained, making the resistor footprint a matter of design choice.

Stanley Wolf discloses lightly doped drains (LDD) in making CMOS devices using PSD and NSD material, table 5.2, page 355. Given Carrigan and Conta

teachings of CMOS technology, LDD would have been used for its known function of their channel effects.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use material having the sheet resistance of Tanaka, the TCR of Aswell and the materials of Wolf to make the implanted TSR of Carriagn, Conta, and Ishinaga in order to obtain a TSR having a resistance variation of a magnitude to be detectable above the noise level of the printhead chip yet being small enough to be associated with each nozzle of the printhead.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection. Claims 1 and 16 have been amended to include the limitation of temperature sense resistor being implanted in the substrate of the printhead, which is known in the art, as shown above.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

Art Unit: 2861

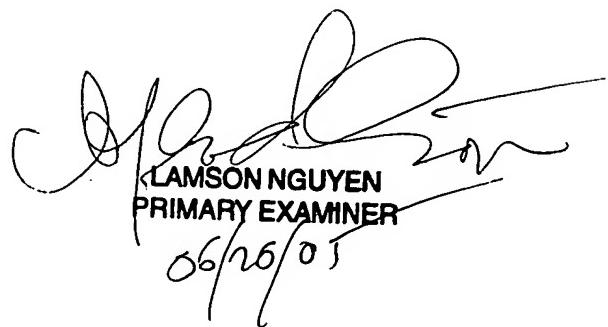
TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lamson D. Nguyen whose telephone number is 571-272-2259. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Talbott can be reached on 571-272-1934. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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LAMSON NGUYEN  
PRIMARY EXAMINER  
06/26/03